

Roll No _____

**END-TERM EXAMINATION
ODD Semester 2024-25**

Course Code: BP701T

Course Name: Instrumental Methods of Analysis



K.R. MANGALAM UNIVERSITY
THE COMPLETE WORLD OF EDUCATION

Programme Name: **B. Pharmacy**

Sem: 7th Semester

Instructions: Attempt all questions from section-A, any two out of three questions from section-B and any seven out of nine questions from section-C.

Section A (20 x1 = 20 Marks)

1	Select the wavelength range corresponding to UV-visible region. a) 400-800 nm b) 200-800 nm c) 25 μm -2.5 μm d) 2.5 μm -1mm	CO-2	L-1
2	Which of the following types of motion is primarily responsible for the absorption of infrared radiation in molecules? a) Rotational motion b) Vibrational motion c) Electronic motion d) Translational motion	CO-1	L-2
3	What characteristic makes paper chromatography suitable for separating amino acids and dyes? a) High resolution b) Fast separation c) Ability to work with a variety of solvents d) High sensitivity	CO-3	L-4
4	An isocratic elution in HPLC is one in which the composition of the solvent a) Remains constant b) Changes continuously c) Changes in a series of steps d) None of these	CO-3	L-2
5	Which technique separates charged particles using electric field? a) Protein denaturing b) Electrophoresis c) ion exchange chromatography d) none of the above	CO-1	L-2
6	A moiety in a molecule that effect UV absorption? a) Auxochrome b) Chromophore c) Inorganic compound	CO-2	L-2

	d) All of these		
7	What is the typical wavelength range associated with the mid-infrared (IR) region? a) 200 - 400 nm b) 400 - 700 nm c) 2.5 - 15 μ m d) 700 - 1000 nm	CO-2	L-1
8	What is the primary factor that differentiates Paper Chromatography from other chromatographic techniques? a) Stationary phase b) Mobile phase c) Solvent polarity d) Paper thickness	CO-3	L-2
9	The separation in Gas-Liquid Chromatography primarily depends on: a) Molecular weight b) Adsorption c) Vapor pressure d) Chemical reactivity	CO-3	L-2
10	Which molecules elute first in Size Exclusion Chromatography? a) Larger molecules b) Smaller molecules c) Charged molecules d) Polar molecules	CO-3	L-2
11	Carbonyl compound shows which transition a) $\pi \Rightarrow \pi^*$ b) $\sigma \Rightarrow \sigma^*$ c) $n \Rightarrow \sigma^*$ d) $n \Rightarrow \pi^*$	CO-5	L-4
12	Flame photometry is based on the measurement of: a) Absorption of light b) Emission of light c) Scattering of light d) Refraction of light	CO-1	L-1
13	Elution in column chromatography is achieved by: a) Adding more stationary phase b) Passing the mobile phase through the column c) Increasing column temperature d) Reducing the column length	CO-3	L-2
14	Column efficiency is measured in terms of number of plates which is a) Inversely related to the square of the peak width b) Directly related to the square of the peak width c) Inversely related to the cube root of the peak width d) directly related to the square of the peak width	CO-1	L-1
15	Which of the following is the application of ion exchange chromatography? a) It is used for softening of water. b) It is used for demineralization of water. c) It is used for separation of similar ion in one sample. d) All of these	CO-4	L-3

16	λ_{max} increase with absorption of radiation in which shift? a) Red shift b) Blue shift c) Hysochromic shift d) None of these	CO-2	L-2
17	In atomic absorption spectroscopy, the amount of light absorbed is proportional to: a) The concentration of the sample b) The purity of the solvent c) The volume of the sample d) The temperature of the flame	CO-1	L-1
18	The time taken by the analyte after sample injection to reach the detector is called _____ a) Dead time b) Solute migration rate c) Adjusted retention time d) Retention time	CO-1	L-1
19	Which of the following cannot be used as adsorbent in Column adsorption chromatography? a) Magnesium oxide b) Silica gel c) Activated alumina d) Potassium permanganate	CO-1	L-1
20	Components with a strong affinity with stationary phase move more slowly than components with weak affinity. a) True b) False	CO-3	L-2

Section B (2 X 10 = 20 Marks)

1	Describe the theory and instrumentation of UV-Visible spectroscopy.	CO-3	L-2
2	Outline the principle and method of thin-layer chromatography, comparing it to paper chromatography.	CO-5	L-4
3	Explain the principle, instrumentation and applications of High-Performance Liquid Chromatography (HPLC) with schematic diagram.	CO-3	L-2

Section B (7 X 5 = 35 Marks)

1	How to perform the column chromatography for analysis of a mixture?	CO-3	L-2
2	Define chromophores and auxochromes. Explain chromogenic agent.	CO-2	L-1
3	What are the factors which can affect ion-exchange chromatography?	CO-4	L-3
4	Explain the principle behind flame photometry.	CO-1	L-2
5	What is fluorescence and phosphorescence? Explain.	CO-3	L-2

6	Describe the process of gel electrophoresis.	CO-4	L-3
7	Derive Beer-Lambert's law and explain possible deviations from this law.	CO-2	L-1
8	Explain the development techniques used in paper chromatography.	CO-5	L-4
9	Analyze the factors influencing fluorescence intensity and explain their significance in fluorescence applications.	CO-5	L-4